

DBMS Lab Experiment 04

To understand and apply the concept of Constraints

- **Course:** DBMS
 - **Name:** Devesh Chandra Srivastava
 - **SapID:** 590017127
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Objective

To understand the concept of data constraints that is enforced on data being stored in the table. Focus on Primary Key and the Foreign Key.

ER → Relational Mapping

Relations:

1. **CLIENT_MASTER**(ClientNo, Name, City, State, Pincode, BalDue, Telephone)
2. **PRODUCT_MASTER**(ProductNo, Description, ProfitPercent, UnitMeasure, QtyOnHand, ReorderLvl, SellPrice, CostPrice)
3. **SALESMAN_MASTER**(SalesmanNo, Name, City, Pincode, State, SalAmt, TgtToGet, YtdSales, Remarks)

Note: Primary keys are underlined. Foreign keys would be added when creating order tables.

1. Table Creation

Creating CLIENT_MASTER Table

```
CREATE TABLE CLIENT_MASTER (
    ClientNo VARCHAR(10) PRIMARY KEY,
    Name VARCHAR(50) NOT NULL,
    City VARCHAR(30),
    State VARCHAR(30),
    Pincode VARCHAR(10),
    BalDue DECIMAL(10, 2) DEFAULT 0
);
```

Creating PRODUCT_MASTER Table

```
CREATE TABLE PRODUCT_MASTER (
    ProductNo VARCHAR(10) PRIMARY KEY,
    Description VARCHAR(100),
    ProfitPercent DECIMAL(5, 2),
    UnitMeasure VARCHAR(20),
    QtyOnHand INT,
    ReorderLvl INT,
    SellPrice DECIMAL(8, 2),
    CostPrice DECIMAL(8, 2)
);
```

Creating SALESMAN_MASTER Table

```
CREATE TABLE SALESMAN_MASTER (
    SalesmanNo VARCHAR(10) PRIMARY KEY,
    Name VARCHAR(50) NOT NULL,
    City VARCHAR(30),
    Pincode VARCHAR(10),
    State VARCHAR(30),
    SalAmt DECIMAL(10, 2),
    TgtToGet DECIMAL(10, 2),
    YtdSales DECIMAL(10, 2),
    Remarks VARCHAR(100)
);
```

2. Inserting Sample Data

Data for CLIENT_MASTER

```

INSERT INTO CLIENT_MASTER (ClientNo, Name, City, State, Pincode, BalDue)
VALUES
('C00001', 'Ivan Bayross', 'Mumbai', 'Maharashtra', '400054', 15000.00),
('C00002', 'Mamta Muzumdar', 'Madras', 'Tamil Nadu', '780001', 0.00),
('C00003', 'Chhaya Bankar', 'Mumbai', 'Maharashtra', '400057', 5000.00),
('C00004', 'Ashwini Joshi', 'Bangalore', 'Karnataka', '560001', 0.00),
('C00005', 'Hansel Colaco', 'Mumbai', 'Maharashtra', '400060', 2000.00),
('C00006', 'Deepak Sharma', 'Mangalore', 'Karnataka', '560050', 0.00);

```

Data for PRODUCT_MASTER

```

INSERT INTO PRODUCT_MASTER (ProductNo, Description, ProfitPercent,
UnitMeasure, QtyOnHand, ReorderLvl, SellPrice, CostPrice) VALUES
('P00001', 'T-Shirts', 5.00, 'Piece', 200, 50, 350.00, 250.00),
('P0345', 'Shirts', 6.00, 'Piece', 150, 50, 500.00, 350.00),
('P06734', 'Cotton Jeans', 5.00, 'Piece', 100, 20, 600.00, 450.00),
('P07865', 'Jeans', 5.00, 'Piece', 100, 20, 750.00, 500.00),
('P07868', 'Trousers', 2.00, 'Piece', 150, 50, 850.00, 550.00),
('P07885', 'Pull Overs', 2.50, 'Piece', 80, 30, 700.00, 450.00),
('P07965', 'Denim Shirts', 4.00, 'Piece', 100, 40, 350.00, 250.00),
('P07975', 'Lycra Tops', 5.00, 'Piece', 70, 30, 300.00, 175.00),
('P08865', 'Skirts', 5.00, 'Piece', 75, 30, 450.00, 300.00);

```

Data for SALESMAN_MASTER

```

INSERT INTO SALESMAN_MASTER (SalesmanNo, Name, City, Pincode, State, SalAmt,
TgtToGet, YtdSales, Remarks) VALUES
('S00001', 'Aman', 'Mumbai', '400001', 'Maharashtra', 3000.00, 100000.00,
50000.00, 'Good'),
('S00002', 'Omkar', 'Mumbai', '400002', 'Maharashtra', 3000.00, 200000.00,
100000.00, 'Good'),
('S00003', 'Raj', 'Mumbai', '400003', 'Maharashtra', 3000.00, 200000.00,
100000.00, 'Good'),
('S00004', 'Ashish', 'Mumbai', '400004', 'Maharashtra', 3500.00, 200000.00,
150000.00, 'Good');

```

3. Exercise on Retrieving Records

Q 1: Find out the names of all the clients

Idea/Plan: We need to retrieve only the Name column from CLIENT_MASTER table. This is a simple projection operation that displays all client names.

```
SELECT Name FROM CLIENT_MASTER;
```

Result

Name
Ivan Bayross
Mamta Muzumdar
Chhaya Bankar
Ashwini Joshi
Hansel Colaco
Deepak Sharma

Q 2: Retrieve the entire contents of the Client_Master table

Idea/Plan: Display all columns and all rows from CLIENT_MASTER. This shows complete client information including ClientNo, Name, City, State, Pincode, and BalDue.

```
SELECT * FROM CLIENT_MASTER;
```

Result

ClientNo	Name	City	State	Pincode	BalDue
C 00001	Ivan Bayross	Mumbai	Maharashtra	400054	15000.00
C 00002	Mamta Muzumdar	Madras	Tamil Nadu	780001	0.00
...

Q 3: Retrieve the list of names, city and state of all the clients

Idea/Plan: Project only three specific columns (Name, City, State) from CLIENT_MASTER. This helps in viewing location information of clients.

```
SELECT Name, City, State FROM CLIENT_MASTER;
```

Result

Name	City	State
Ivan Bayross	Mumbai	Maharashtra
Mamta Muzumdar	Madras	Tamil Nadu
Chhaya Bankar	Mumbai	Maharashtra
...

Q 4: List the various products available from the Product_Master table

Idea/Plan: Retrieve only product descriptions to show what products are available in inventory. This gives a quick overview of the product catalog.

```
SELECT Description FROM PRODUCT_MASTER;
```

Result

Description
T-Shirts
Shirts
Cotton Jeans
Jeans
Trousers
...

Q 5: List all the clients who are located in Mumbai

Idea/Plan: Filter CLIENT_MASTER table using WHERE clause to show only clients where City = 'Mumbai'. This helps identify all Mumbai-based clients.

```
SELECT * FROM CLIENT_MASTER  
WHERE City = 'Mumbai';
```

Result

ClientNo	Name	City	State	Pincode	BalDue
C 00001	Ivan Bayross	Mumbai	Maharashtra	400054	15000.00
C 00003	Chhaya Bankar	Mumbai	Maharashtra	400057	5000.00
C 00005	Hansel Colaco	Mumbai	Maharashtra	400060	2000.00

Q 6: Find the names of salesman who have a salary equal to Rs. 3000

Idea/Plan: Filter SALESMAN_MASTER where SalAmt = 3000.00 and project only the Name column. This identifies salesmen earning exactly Rs. 3000.

```
SELECT Name FROM SALESMAN_MASTER  
WHERE SalAmt = 3000.00;
```

Result

Name
Aman
Omkar
Raj

4. Exercise on Updating Records

Q 1: Change the city of ClientNo 'C 00005' to 'Bangalore'

Idea/Plan: Use UPDATE statement to modify the City column for a specific client identified by ClientNo = 'C 00005'. This updates client location information.

```
UPDATE CLIENT_MASTER  
SET City = 'Bangalore'  
WHERE ClientNo = 'C00005';
```

Q 2: Change the BalDue of ClientNo 'C 00001' to Rs. 1000

Idea/Plan: Update the balance due amount for client C 00001. This modifies the financial record to reflect new outstanding balance.

```
UPDATE CLIENT_MASTER  
SET BalDue = 1000.00  
WHERE ClientNo = 'C00001';
```

Q 3: Change the cost price of 'Trousers' to Rs. 950.00

Idea/Plan: Update the CostPrice in PRODUCT_MASTER for the product identified by Description = 'Trousers'. This adjusts the product cost.

```
UPDATE PRODUCT_MASTER  
SET CostPrice = 950.00  
WHERE Description = 'Trousers';
```

Q 4: Change the city of the salesman to Pune

Idea/Plan: Update City column in SALESMAN_MASTER. Note: Without WHERE clause, this updates ALL salesmen to city 'Pune'. If specific salesman needed, add WHERE condition.

```
UPDATE SALESMAN_MASTER  
SET City = 'Pune';
```

5. Exercise on Deleting Records

Q 1: Delete all salesman whose salaries are equal to Rs. 3500

Idea/Plan: Use DELETE statement with WHERE clause to remove salesmen records where SalAmt = 3500.00. This removes salesmen with that specific salary.

```
DELETE FROM SALESMAN_MASTER  
WHERE SalAmt = 3500.00;
```

Q 2: Delete all products where quantity on hand is equal to 100

Idea/Plan: Remove products from PRODUCT_MASTER where QtyOnHand = 100. This cleans up products with exactly 100 units in stock.

```
DELETE FROM PRODUCT_MASTER  
WHERE QtyOnHand = 100;
```

Q 3: Delete from Client_Master where state is 'Tamil Nadu'

Idea/Plan: Remove all client records where State = 'Tamil Nadu'. This filters and deletes clients from that specific state.

```
DELETE FROM CLIENT_MASTER  
WHERE State = 'Tamil Nadu';
```

6. Exercise on Altering Table Structure

Q 1: Add a column called 'Telephone' to Client_Master table

Idea/Plan: Use ALTER TABLE ADD COLUMN to add a new Telephone column of BIGINT type. This extends the table structure to store phone numbers.

```
ALTER TABLE CLIENT_MASTER  
ADD Telephone BIGINT;
```

Q 2: Change the size of SellPrice column to 10,2

Idea/Plan: Use ALTER TABLE ALTER COLUMN to modify the data type of SellPrice to DECIMAL (10,2). This increases precision to accommodate larger prices.

```
ALTER TABLE PRODUCT_MASTER  
ALTER COLUMN SellPrice TYPE DECIMAL(10, 2);
```

7. Exercise on Deleting Table Structure

Q 1: Destroy the table Client_Master along with its data

Idea/Plan: Use DROP TABLE to completely remove CLIENT_MASTER table including its structure and all data. This is irreversible.

```
DROP TABLE CLIENT_MASTER;
```

Verification Queries

View All Tables

```
SELECT table_name  
FROM information_schema.tables  
WHERE table_schema = 'public';
```

View Table Structure

```
-- Using psql meta-command  
\d CLIENT_MASTER  
\d PRODUCT_MASTER  
\d SALESMAN_MASTER  
  
-- Using SQL query  
SELECT column_name, data_type, character_maximum_length  
FROM information_schema.columns  
WHERE table_name = 'client_master';
```

Count Records

```
SELECT COUNT(*) AS ClientCount FROM CLIENT_MASTER;  
SELECT COUNT(*) AS ProductCount FROM PRODUCT_MASTER;  
SELECT COUNT(*) AS SalesmanCount FROM SALESMAN_MASTER;
```
